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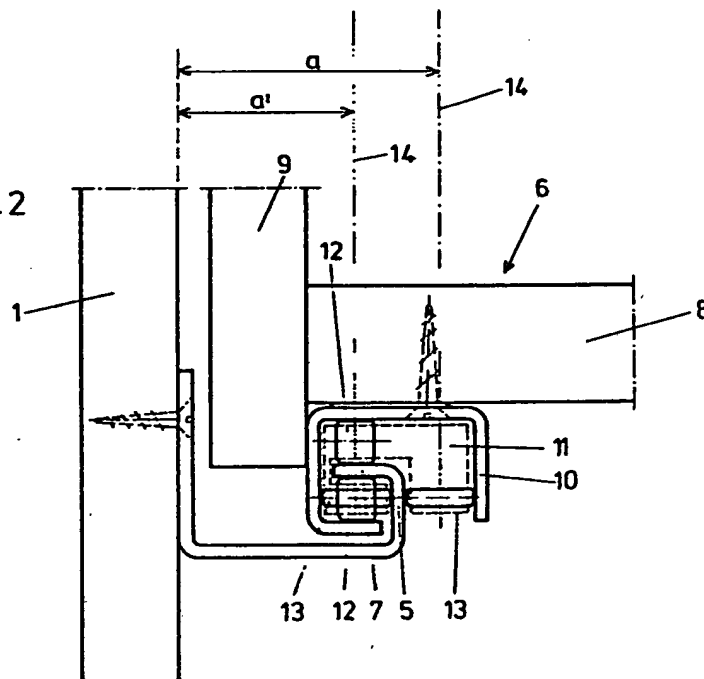
A4B

Selected US specifications from IPC sub-class A47B

(54) Underside pull-out guide for drawers or the like

(57) The underside pull-out guide is constructed in such a way that when the drawer 6 is pulled out the pull-out rail 10 is not visible. The pull-out rail 10 is disposed below the base 8 of the drawer 6 and has a box-like cross-section into which a vertical web 5 of a support rail 2 engages from below. The support rail is secured to a lateral wall 1 or base wall of the furniture. Inside the box-like cross-section of the pull-out rail 10 the vertical web 5 passes into a horizontal web 7, on which rollers 12, mounted freely rotatably in a cage 11 and held equidistantly, bear from above and below. In order to achieve favourable stressing ratios for the support rail, the horizontal web 7 is orientated towards the adjacent lateral wall 1 of the piece of furniture or towards the adjacent lateral face 9 of the drawer 6. Lateral guide rollers 13 prevent lateral displacement of the drawer 6.

Fig. 2



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Fig. 1

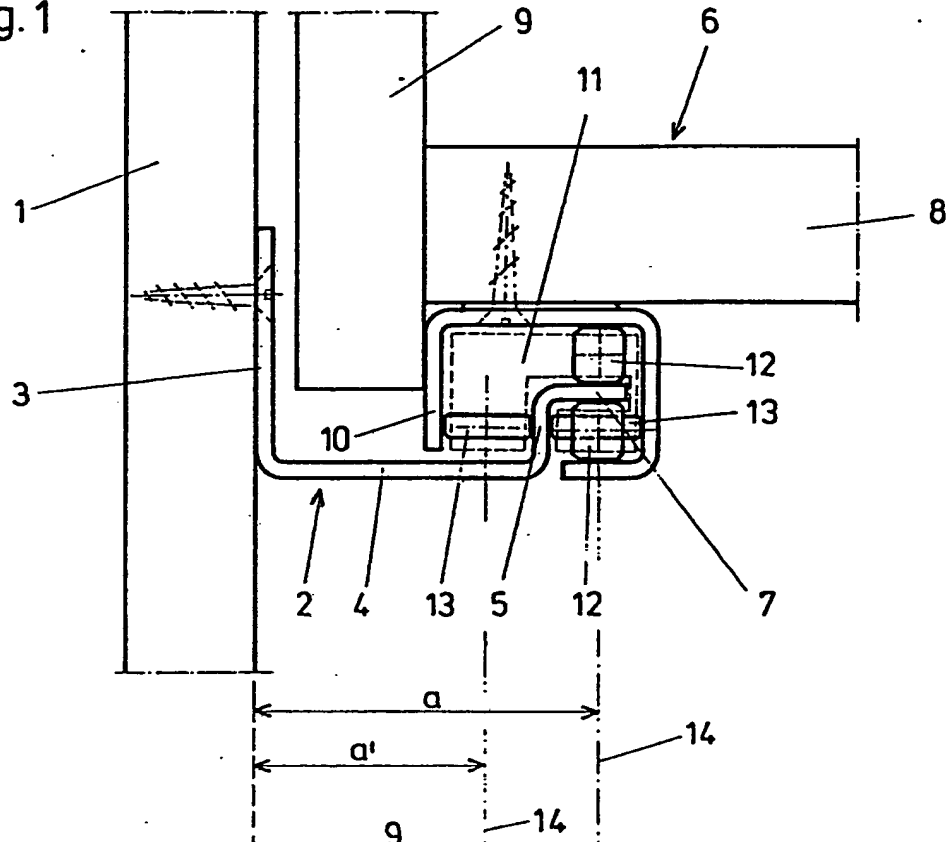


Fig. 2

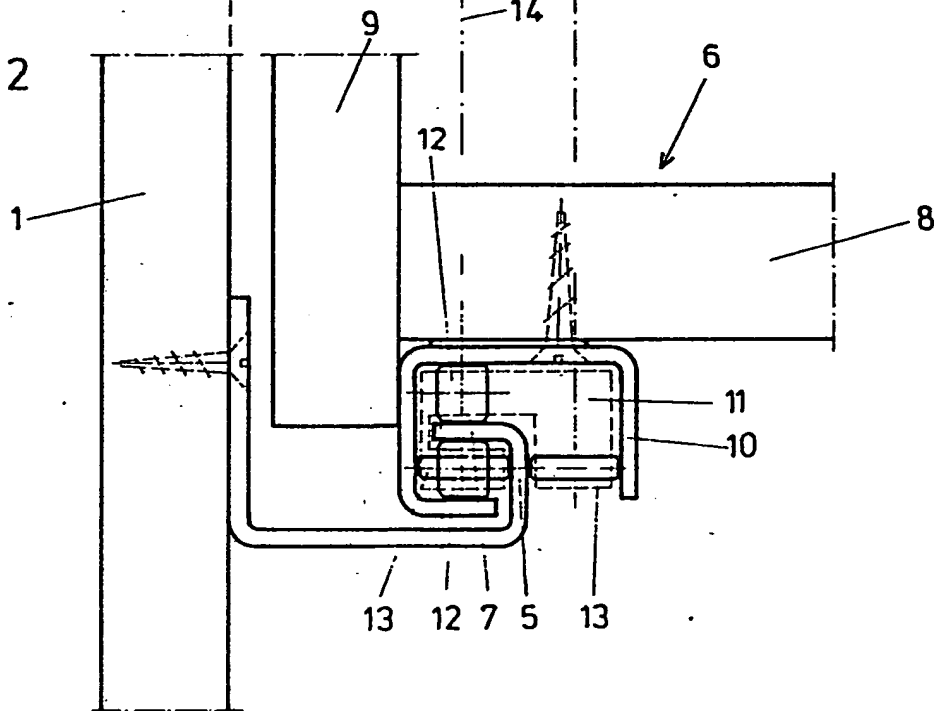


Fig. 3

1 6 7 8 9 10 11 12 13 15

Fig. 4

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SPECIFICATION

Underside pull-out guide for drawers or the like

5 The invention relates to an underside pull-out guide for drawers or other withdrawable furniture parts, having at each side of the drawer a pull-out rail to be secured to the underside
10 of the drawer and a support rail attachable to the piece of furniture, e.g. by means of a fastening flange, and having load-transmitting slides or rollers which are mounted in a cage or carriage, the pull-out rail having a substantially box-like cross-section and the cross-section of the support rail comprising a vertical web projecting from below into the pull-out rail and a horizontal web which projects therefrom and which acts as a track for the slides or rollers, and slides and/or rollers being provided both above and below the horizontal web.

Pull-out guides of this type are known, for example from Austrian Patent 379 497 and
25 EP-A-0 098 511. In these pull-out guides, the horizontal web of the support rail, which acts as a track for the slides or rollers, is orientated inwards, i.e. the horizontal webs acting as tracks — of the support rails of the pull-out guides present in pairs are orientated towards one another, i.e. towards the middle of the drawer. Guides of the type described are used as so-called underside pull-out guides. In this case the pull-out guide joined to the withdrawable furniture part is not secured to the lateral face of the withdrawable furniture part as otherwise customary, but is secured to the underside thereof, so that when the furniture part is pulled out the said pull-out guide is not visible. A support rail fixed to the wall of the piece of furniture thus comprises a projecting, substantially horizontal arm, which forms the connexion between a fastening flange of the said support rail, by which it is secured to the wall of the piece of furniture, and the webs thereof, which project into the pull-out rail and which cooperate with the slides or rollers. This projecting arm is therefore relatively large as compared with support rails for drawer
35 guides of conventional design, since it must project below the underside of the furniture part. On the other hand, the loads which are to be absorbed by drawers of this type are relatively high. The support rail must therefore
50 be constructed so much more strongly and with so much more stability the greater this projecting part, which acts as a lever arm, by way of which the load forces are transmitted by means of the slides or rollers to the support rail.

In addition, a pull-out guide for drawers is known from the Austrian Patent 382 897, having at each side a pull-out rail on the side of the drawer and a support rail and rollers or
65 the like on the side of the piece of furniture,

which transmit vertical forces from the pull-out rails to the support rails and which are mounted in carriages, the pull-out rails and the support rails having a U-section over at least part of their cross-section. The rail on the side of the drawer is secured to the lateral wall of the drawer and the aforesaid carriage with rollers ensures the displaceability of the two rails relative to one another. Since these rollers are
70 very small and these very small rollers are additionally mounted in cage-like compartments in the carriage, in which case these compartments should have only slight clearance with respect to the rollers, these guides are extremely susceptible to dirt. Coarse dust or even crumbs (to be taken into consideration in the case of kitchen furniture in particular) obstruct the free mobility of the rollers in their cage-like compartments, as a result of which the easy running of the guide is considerably impaired. In order to prevent such contamination, it has therefore been proposed in this prior publication that both the profile of the support rail towards the piece of furniture and the profile of the pull-out rail towards the drawer should be open, and also that the support rail and the pull-out rail should engage in one another. In this way, contamination should be prevented. In the case of drawers whose lateral walls are produced from extruded material, a lateral screen, which is drawn down over the rail of the pull-out guide and thus covered the latter sufficiently, has been provided for solving the same problem (DE-A-28 13 778, DE-A-28 44 850, DE-A-28 32 176).

Taking underside pull-out guides of the type described above as a starting point, the invention is based on the idea of improving these in such a way that the lever arm, by way of which the loads are transmitted from the support rail, should be kept as small as possible.

According to the invention, the horizontal web acting as the track is orientated outwards as viewed from the vertical web of the support rail, i.e. towards the adjacent wall of the piece of furniture or towards the lateral face of the withdrawable furniture part that is adjacent the pull-out rail receiving the said horizontal web.

115 Although the subject of the invention is also a pull-out guide for drawers and the like, in this case the pull-out rail is not arranged on the lateral face of the drawer, but on its underside, so that when the withdrawable furniture part is pulled out this pull-out rail is not visible. The problem highlighted for a drawer guide or pull-out guide according to Austrian Patent 362 897 concerning the contamination mentioned is totally irrelevant in an underside guide of this type, since the pull-out rail is open only at the bottom.

Underside guides require guide elements on both sides with respect to a vertical web of the stationary rail of the piece of furniture.

130 This necessitates a relatively substantial struc-

tural width of these guides, so that it is not advisable for guides which are provided for such underside assembly to be assembled in the manner disclosed in Austrian Patent 362 897 for example. On the other hand it should be noted that the guide according to Austrian Patent 362 897 is not suitable as an underside guide, since it does not contain the lateral guide described.

10 The guide according to Austrian Patent 362 897 is a guide in which the rails forming the guide lie between the lateral wall of the piece of furniture and the lateral face of the drawer; the subject of the invention on the other hand is a so-called underside guide. If the problem to be solved by the proposal according to the Austrian Patent 362 897 lies in preventing or at least reducing the contamination which restricts the mobility of the rollers, this problem is *a priori* not relevant in the case of the underside guide according to the present invention. If the guide according to the Austrian Patent 362 897 is not suitable for underside assembly on account of the absence of a lateral guide, it is not therefore advisable for the underside guide according to the invention to be fitted between the lateral face of the drawer and the wall of the piece of furniture, since it has an excessive structural width which results primarily from the fact that the elements needed for the lateral guide of the rails require a corresponding space.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which

Fig. 1 is a cross-section through an underside guide of conventional design;

Fig. 2 is a cross-section through an underside guide of a first embodiment according to the invention;

Fig. 3 is a cross-section through an underside guide of a second embodiment according to the invention;

Fig. 4 is an oblique view of a cage or carriage with rollers.

Fig. 1 shows a known design in cross-section, only one side of the piece of furniture being illustrated in this case. A support rail 2 is secured to the inside of the wall 1 of the piece of furniture. The support rail 2 comprises a fastening flange 3, a horizontally projecting arm 4, which passes into a vertical web 5, and a horizontal web 7 projecting towards the middle of the drawer 6.

A pull-out rail 10, which has a box-like cross-section, is secured to the underside of the base 8 of the withdrawable furniture part 6, directly adjacent to the lateral face 9 thereof. A carriage carrying load-transmitting rollers 12 with horizontal axes of rotation, is accommodated in the box-like cross-section of the pull-out rail 10, such rollers 12 being disposed both above and below the horizontal web 7. In addition, lateral guide rollers 13 with vertical axes of rotation, which prevent

lateral displacement of the drawer 6, i.e. displacement to the right or the left in the plane of the drawing, are provided in the carriage 11.

70 The line of application 14 of the loading forces is at the distance *a* from the wall 1 of the piece of furniture. The loading moment resulting from the magnitude of the force present in the line of application 14 and from the lever arm *a* determines the dimensions of the support rail 2.

Fig. 2 shows an underside guide according to the invention. In this illustration all the parts which correspond to the functionally similar parts according to Fig. 1 have been given the same reference numerals. In this case the horizontal arm 7, which is used to transmit force in conjunction with the rollers 12, is orientated outwards, i.e. towards the adjacent wall 1 of the piece of furniture, or towards the adjacent lateral face 9 of the drawer 6. This horizontal arm 7 acts as a track for the rollers 12.

It is evident from comparison of the two Figs. 1 and 2 that on account of the arrangement according to the invention the lever arm *a'* in the case of the embodiment according to Fig. 2 is considerably shorter, namely by approximately 30%. The loading of the support rail 1 is correspondingly more favourable.

The arrangement according to the invention, however, offers a further advantage when the support rail 3 is formed for example without a lateral fastening flange 3 and is secured directly to a base part 15, as shown in Fig. 3. In Fig. 3, too, all the parts with the same function have been given the same reference numerals as in Figs. 1 and 2. There is the advantage, as also applies of course to the embodiment according to Fig. 2, that when the support rail 1 is produced from a strip-like steel material the turned-up edges which produce the profile can always be turned in the same direction. This simplifies the manufacturing process.

CLAIMS

1. An underside pull-out guide, being one of two pull-out guides provided at respective sides of a drawer or other withdrawable part of a piece of furniture, the said underside pull-out guide comprising a pull-out rail securable to the underside of the withdrawable part and a support rail securable to the piece of furniture and accommodating load-transmitting slides and/or rollers which are mounted in a cage or carriage, the pull-out rail having a substantially box-like cross-section, the cross-section of the support rail comprising a vertical web projecting from below into the pull-out rail and a horizontal web which projects therefrom and which acts as a track for the slides and/or rollers, slides and/or rollers being provided both above and below the horizontal web, characterized in that the horizontal web

acting as the track is orientated outwards as viewed from the vertical web of the support rail, i.e. towards the adjacent wall of the piece of furniture or towards the corresponding side of the withdrawable furniture part.

2. An underside pull-out guide as claimed in claim 1, in which the cross-section of the support rail has a horizontal arm projecting from the vertical web, below the pull-out rail, in the same direction as the horizontal web acting as the track.

3. An underside pull-out guide as claimed in claim 2, in which the said arm has a vertical flange for securing to a side wall of the piece of furniture.

4. An underside pull-out guide substantially as described with reference to, and as shown in, Figure 2 or Figure 3 of the accompanying drawings.

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